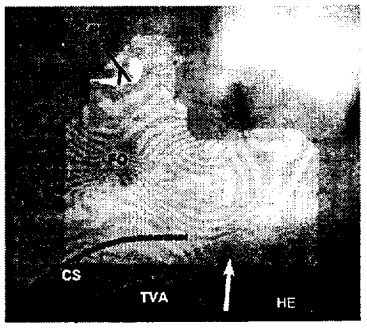
ode array and a bipolar His electrogram (HE) were used to record conduction patterns in a rabbit AV node preparation superfused at 36°C. The right atrial septum superior to the foramen ovalis (FO) was electrically paced via a bipolar electrode (PE) at a constant interval of 400 ms. The tissue was stained with a 2 mM solution of di-4-ANEPPS optically active dye for 20 minutes. The isochronal activation patterns were constructed by linear interpolation of times in the image space between photodiode elements (effective distance 625 μm on center). Light and dark banding represent 1 ms isochrones.

Results: This preparation demonstrated a normal atrio-Hisian (AH) interval of 56 ms. An isochronal map of one such impulse is shown in the figure. With steady-state pacing, the pattern of activation above the compact node (arrow) was always similar from impulse to impulse. Pattern variation was most apparent at the compact node and below. Slow conduction as indicated by the narrow isochrones was confined to the compact node and subordinate fibers immediately above the tricuspid valve annulus (TVA). The broadening of the isochrones in the lower right-hand corner of the preparation indicates the faster conduction velocities of the His-Purkinje system beneath the HE. The width and breadth of the slow conduction band had the greatest variation with beat-to-beat changes in AH interval.

Conclusion: Optical recordings with linear interpolation have the potential for resolving the heterogenous conduction velocities in the AV node and producing meaningful single conduction patterns. This technique should be useful in describing AV node conduction patterns under a variety of conditions.



1009-50 Pseudo Atrioventricular and Ventriculoatrial Block Induced by Radiofrequency Ablation of Several Atrio-AV Nodal Connections

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We determined the roles of the various atrial(A)-atrioventricular nodal (AVN) connections in AV and VA conduction by sequential radiofrequency (RF) ablation. In prior studies, RF ablation applied epicardially to the "fast" pathway (FP) induced A-His bundle (Hb) area delay $\geq$40 msec and the shift of retrograde A activation from the Hb area to the area of the coronary sinus (CS) ostium, "slow" pathway (SP). Subsequent SP ablation significantly increased the A-H interval, $\geq$70 msec, and caused VA block in >50%. Histology showed an intact AVN and ablation of its posterior input. In this study, 6 dogs, FP and SP were ablated by the same epicardial approach. Complete AV and VA block were observed in only 1 of 6 dogs. In another 9 dogs, a third lesion was placed endocardially from the fossa ovalis to the entrance of the inferior vena cava, in addition to FP and SP ablation, causing complete AV and VA block in 5 of 9 dogs. During block, a stable AV junctional escape rate (58 $\pm$ 10/min) appeared, indicating a supra-hisian pacemaker. In 1 case of "AV block", pacing from the A close to the Hb showed 1:1 A-Hb-V conduction up to a rate of 200/min. In addition, there was 1:1 retrograde conduction to the high right (HR) A with marked conduction delay. In 2 other cases, there was 1:1 V-HbA conduction during RV pacing, but HRA and CSA electrograms were dissociated. Postmortem, the AV junction showed that all radiofrequency lesions bordered the triangle of Koch. We conclude that there are multiple atrio-AVN connections which provide back-up mechanisms to prevent combined AV and VA block in the normal heart. Moreover, ablation of two or more A inputs can result in pseudo AV and VA block, since some A remains connected to a functional AVN and Hb.

1010 Importance of Gender and Type of Stress

Wednesday, March 22, 1995, Noon–2:00 p.m.
Ernest N. Morial Convention Center, Hall E
Presentation Hour: Noon–1:00 p.m.

1010-61 Influence of Gender on the Diagnosis of Coronary Artery Disease Using Exercise Thallium-201 SPECT

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Previous studies of Tl-201 SPECT for the diagnosis of coronary artery disease (CAD) have not examined the influence of gender on the accuracy of the test. We examined the results of Tl-201 in 567 pts (403 men, 164 women) who underwent exercise Tl-201 SPECT and coronary angiography.

All pts exercised maximally, with Tl-201 injection 1 min prior to the completion of exercise. SPECT was obtained using a 2- or 3-headed camera, obtaining images within 10 minutes of stress and 4 h later. Using a 24 segment model, perfusion defects were identified by the reduction of regional activity >20% below maximal (>30% in inferior and posterior segments); reversibility was identified by >15% increase of counts in the redistribution image. Two-dimensional echocardiograms were available in 163 pts (including 83 women), with measurements of left ventricular (LV) dimensions and calculation of LV mass using the Penn convention. Significant CAD (n = 324) was defined by stenoses >50% in the left main, >70% in the main coronary vessels; 172 had multivessel (MVD) and 152 had single vessel disease (SVD), with more SVD in women (55% vs 44%, p = NS). The overall sensitivity of exercise Tl-201 SPEGT was 74%. The specificity in the 243 pts without CAD was 50% (41% in men, 67% in women), reflecting referral bias to angiography. Among 244 men with CAD, the sensitivity was 79%, compared with 61% in 80 women ($p < 0.002$). The sensitivity for MVD was 86% in men and women (p = NS). SVD was present in 108 men and 44 women, among whom the sensitivities were 83% and 59% respectively ($p < 0.0001$).

In order to further evaluate the causes of lower exercise Tl-201 sensitivity in women, a subgroup of 83 with echocardiographic data were analyzed. Pts with true positive (n = 26) and false negative (n = 18) results demonstrated a similar hemodynamic response to stress, workload, and LV dimensions. Pts with false negative findings had a higher prevalence of single vessel disease (89% vs 23%, $p < 0.0001$), and technically difficult studies (39% vs 4%, p = 0.01).

Conclusion: Exercise Tl-201 SPECT is effective for the diagnosis of MVD in women, but is less sensitive for the detection of SVD than in men. The lower sensitivity of Tl-201 in women does not appear to be explained on the basis of LV dimensions or exercise capacity.

1010-62 Impact of Breast Repositioning in Women on SPECT Thallium-201 Myocardial Perfusion Imaging

John Fox, Prateek Dalal, Evangeline Luna, Carolyn Klepser, Andrew Van Tosh, Roberto Roberti, Jennifer Pompliano, Steven F. Horowitz. *Beth Israel Medical Center, New York, NY*

Breast attenuation (BA) is recognized as a cause of artifactual anterior perfusion abnormalities on SPECT thallium imaging (Tl) in women. To study the effect of BA on *all* myocardial regions, we used the change in apparent regional perfusion caused by left breast repositioning as an index of BA. Tl was performed on 432 women and 2 redistribution images were acquired: R1 (breast neutral position) and R2 (breast repositioned to upper left). In 11 control pts the R2 image was performed without repositioning. For each pt, 2 separate polar maps were constructed from R1 and R2 short axis slices and were divided into lateral, inferior, septal, anterior, and apical sectors. Mean normalized counts per pixel (MNC) were determined for each sector. The change in apparent perfusion due to breast repositioning for a given sector was computed as (MNC in R2) — (MNC in R1) and was determined for each sector in all pts. The change in apparent perfusion occurring in a sector due to intrastudy variability was determined as the 95% confidence limits of (MNC in R2) — (MNC in R1) for that sector in the control subjects. A significant change in apparent perfusion in a sector due to breast repositioning was defined as one which exceeds the 95% confidence limits for intrastudy variability for that sector.

Results: Breast repositioning caused a significant change in apparent perfusion in 91% of patients in *at least one sector*. The number of pts showing a change in apparent perfusion in *each sector* is shown: